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BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Paper No. 18

Application Number: 09/035944

Filing Date: 3/6/98

Appellant(s): John G. Freed

Edward H. Green III

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7-15-02.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-24 stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,758,271	Rich et al	5-1998
6,134,430	Younis et al	10-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-24 are rejected under 35 U.S.C. 103(a). This rejection is set forth in prior Office Action, Paper No. 15.

(11) Response to Argument

The examiner disagrees with the appellant's assertion that Rich in view of Younis does not render unpatentable the present invention. The appellant argues that a *prima facie* case of obviousness has not been established by the examiner, asserting that a) there is insufficient motivation in the applied art, b) neither reference alone or in combination teaches all of the limitations of the present invention and c) no reasonable expectation of success is found in the applied art.

Regarding all three points, that is, the combination of references, the examiner asserts that the combination of Rich and Younis is proper.

Regarding point A, the lack of sufficient motivation, Rich teaches a general gain control loop, wherein a measured error rate is used to adjust a gain factor (in element 108). Given that the receiver has gain, it inherently includes amplification means, as does any gain control system with a positive gain value. So, in effect, Rich discusses means for modifying the gain of an amplification means based on a detected error signal.

Younis teaches a system which is quite analogous to the Rich reference: a gain system including an amplifier 1220(a-b). In the case of Younis, the amplifier is controlled in a manner very similar to Rich, that is, the characteristic of the amplifier (the adjustable Input Intercept Point) is adjusted according to a measured non-linearity in the signal. Younis also discloses the utility of providing a gain control based on a received signal using a specific kind of amplifier, an LNA (col 3 lines 34-54, col 10 lines 29-33) and suggests combining said step with the adjustment of the IIP (col 4 lines 28-32) of the LNA, while stating that merely adjusting the gain may degrade the noise figure of the receiver (col 4 lines 30-32). This,

unfortunately, is a common problem in receiver design, as adjusting the gain of a gain control loop may introduce unwanted noise factors based on said gain value.

Younis further discloses that the use of a specifically low-noise amplifier (LNA) with an adjustable IIP is an improvement for such a system, stating that adjusting the IIP of the amplifier "minimizes degradation in the performance of receiver 1200", see col 12 lines 1-4, in order to provide "a programmable dynamic range receiver which provides the requisite level of performance at reduced power consumption", see abstract. As such, the examiner asserts that there is more than sufficient motivation to combine the two references, as Younis specifically states that a standard gain control loop may be used with an LNA, and that adjusting the LNA's IIP improves performance over a fixed IIP-amplifier. In other words, Younis discloses the use of an LNA in a gain-control loop, but states that an LNA should have an adjustable IIP in order to avoid noise and power problems. Given that LNA's are often counted on in receivers to provide a clean, noise-free signal, one of ordinary skill in the art would no doubt have been motivated by both the common knowledge in the art as well as the suggestion by Younis, to use an LNA in a gain control loop such as that taught by Younis; the adjustment of the IIP would have reduced noise and power losses as well, as succinctly stated by Younis, and as such one of ordinary skill in the art would have been led to a gain-control loop with a low-noise amplifier and an adjustable IIP.

Regarding point B, the lack of a teaching of all limitations in the instant invention, the examiner supports the combination of Rich and Younis for the following reasons. First, the appellant has stated that, while Rich teaches a gain control based on an error rate, and Younis discloses an adjustment of an amplifier characteristic based on a measured non-linearity, and as such there are significant differences between the two methods which make them impossible to constructively combine. However, the examiner

notes that Younis does not merely teach that the IIP is adjusted according to a general non-linearity; Younis specifically states that the IIP is adjusted based on a comparison between a measured RSSI value and an RSSI threshold, the threshold being adjusted based on an error rate. As such, the IIP is adjusted based at least in part on the error rate. Note that e.g. claim 1 does not specifically state that the IIP is adjusted directly on the error rate, or suggest that an intermediary calculation such as that taught by Younis could not apply. Note also that Younis teaches the inclusion of an adjustable IIP in an amplifier in a circuit which adjusts gain based on a received signal strength or power (col 3 lines 34-54, col 10 lines 29-33), and later teaches that the received signal strength may affect an adjustable IIP based also on an error rate.

Further, the appellant states that Rich does not teach a similar amplifier to Younis; however, Rich discloses that a receiver typically has a fixed-gain LNA, and that linearity can be a problem for such a circuit (col 3 lines 46-50). While the appellant is correct in stating that Rich teaches a variable-gain amplifier, unlike the fixed-gain amplifier of Younis, note that Rich states that the amplifier may also be a fixed-gain amplifier combined with a variable attenuator (col 7 lines 6-12), the same system as that taught by Younis. Given that Rich teaches the use of a fixed-gain amplifier, and also teaches that a fixed-gain amplifier in a receiver is typically an LNA (which can have linearity problems), and that Younis teaches a fixed-gain LNA with an adjustable IIP based on non-linearity (and also error rate), the examiner therefore asserts that all of the limitations of e.g. claim 1 are taught by the combination of the two references.

Regarding point C, that is, the lack of a reasonable expectation of success, the examiner believes that, given the close similarities between the two references, one of ordinary skill in the art could have reconstructed the appellant's invention with a reasonable expectation of success and a minimum of

difficulty. Given that, as stated above, the teaching by both Rich and Younis of the use of a fixed-gain amplifier with a variable attenuator to adjust the gain of a receiver and the suggestion by both references to utilize LNAs with attenuators for gain control, and the teaching by Younis to further add an adjustable IIP to lower noise and power losses in a fixed-gain LNA-based gain control circuit, the examiner believes that the differences between the two references are negligible enough to have allowed on of ordinary skill in the art to have made the present invention without significant modification.

Lastly, while the appellant states that the combined invention of Rich in view of Younis does not teach a variable gain and variable IIP controlled by a DSP, the examiner reminds the appellant that 1) the combined invention of Rich in view of Younis discloses the adjustment of both gain and the IIP, and further 2) the use of a DSP is neither taught nor suggested in the present claims, and as such said limitation is not read into the claims.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Charles R. Craver

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PATENT EXAMINER

cc

~~December 6, 2001~~

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